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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/312,479	05/17/1999	ROBERT J. HENNICK	289-237.10	2665

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EXAMINER

LUU, THANH X

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 03/29/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/312,479

Applicant(s)

HENNICK ET AL.

Examiner

Thanh X Luu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 January 2002.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-37 and 45-108 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-37 and 45-108 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Prosecution Application

1. The request filed on January 10, 2002 for a Continued Prosecution Application (CPA) under 37 CFR 1.53(d) based on parent Application No. 09/312479 is acceptable and a CPA has been established. An action on the CPA follows.

Claims 1-37 and 45-108 are currently pending.

Specification

2. The substitute specification filed January 10, 2002 has not been entered because it does not conform to 37 CFR 1.125(b) because: it is unclear why a substitute specification is needed and Applicant did not submit a marked up copy of the specification showing changes, and a statement that the substitute specification includes no new matter is missing.

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Examiner also notes that in the substitute specification all the claims (including newly added claims) were presented and renumbered. The numbering of claims in the substitute specification is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Claim Objections

3. Claims 1, 11, 22, 45-52, 56, 57, 82, 83 and 95 are objected to because of the following informalities:

In claims 1 and 46, "the x or y directions" lack proper antecedent basis.

In claims 11 and 22, "said pin body" lacks proper antecedent basis.

In claims 45 and 58, "said image sensor" lacks proper antecedent basis.

In claim 46, "said assemblies" lacks proper antecedent basis.

In claims 46-52, 56 and 57, "said optical subassembly" or "said optical subassemblies" lacks proper antecedent basis.

In claims 47-50, 52, 56 and 57, "at least one of said optical subassemblies or image sensor subassemblies" lacks proper antecedent basis. There appears to be only one subassembly of each type.

In claim 82, "said" is misspelled.

In claim 83, "the z-direction" lacks proper antecedent basis.

In claim 95, "said optical and image sensor assemblies" lacks proper antecedent basis.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-25, 45-58, 80-89 and 95 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is unclear in its given context how time is encompassed by the terms "immediately prior to". It is also unclear which direction is an x or y direction since no coordinate system has been defined.

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In claims 13 and 46, it is unclear in its given context which direction is an x or y direction. No origin or coordinate system has been claimed.

In claim 82, it is unclear what Applicant intended to claim. If there is no contact between the subassemblies then the subassemblies can't be soldered together.

In claims 82, 83 and 86, it is unclear in its given context which direction is a z direction. No origin or coordinate system has been claimed.

In claim 89, it is unclear in its given context how many holes are claimed. Furthermore, it is unclear how "a hole" in claim 89 is functionally related to the rest of the invention.

In claim 95, it is unclear in its given context what "a component" part consists of or means.

Claims 2-12, 14-25, 45, 47-58, 80, 81, 84, 85, 87 and 88 are indefinite by virtue of their dependency on an indefinite claim.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

7. Claims 59, 61-64, 66, 68-71, 89-92, as understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Kanaya et al. (U.S. Patent 5,155,401).

Regarding claims 59, 61-64, 66, 68-71 and 89-92, Kanaya et al. disclose (see Figure 15) an imaging device comprising: an image sensor subassembly including an image sensor (33) mounted on a printed circuit board (35); an optical subassembly, the optical subassembly including an optical element (an aperture or reflecting member in disk 32) disposed on a substantially rigid member (the disk); at least one solderable surface formed on either of the printed circuit board or optical subassembly defining at least one solder receiving interface (28, 29) between the printed circuit board and the optical subassembly; and solder material for bonding the subassemblies disposed at the at least one solder receiving interface (see column 11, lines 20-24). Kanaya et al. further disclose (see Figure 15) the optical element having a single receive optical axis. The housing inherently provides a handle. Kanaya et al. also disclose (see Figure 15) the at least one solderable surface is made in an irregular configuration or a pin (28, 29), wherein the pin has a substantially uniform diameter. The circuit board further has holes or through-holes (see Figures 9-11).

8. Claims 1, 2, 4, 7, 12, 13, 15, 18, 23, 24, 26-28, 31-33, 35, 37, 46, 47, 49, 52, 53, 55, 57, 80-83, 86-88, 95, 96, 98, 101-103, 105 and 106, as understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Kropp (U.S. Patent 5,902,997).

Regarding claims 1 and 2, Kropp discloses (see Figure 4) a method for mounting an optical subassembly (44, 45) of an optical reading device to an image sensor subassembly (40) of an optical reading device, the method comprising the steps of:

inherently moving the optical and image sensor subassemblies in proximity with one another; and soldering the optical and image sensor subassemblies together with a solder material (see column 5, lines 13-17 and lines 46-52), wherein before soldering, there is no contact between the optical subassembly and the image sensor subassembly to prevent movement of the optical subassembly relative to the image sensor subassembly. That is, the instant before the two subassemblies touch prior to soldering, there is no contact to prevent movement of the subassemblies relative to each other. Kropp further discloses (see column 5, lines 14-16) forming a solderable surface (40, 52) on at least one of the optical or image sensor subassemblies.

Regarding claims 95 and 96, Kropp discloses (see Figure 4) a method for mounting an optical subassembly of an optical reading device to an image sensor subassembly, the method comprising: inherently moving the optical subassembly (44, 45) and the image sensor subassembly (40) in proximity to one another; aligning the subassemblies; and without the main parts of the subassemblies touching each other, soldering the subassemblies together. That is, only the solder bumps and solderable surface touch. Kropp further discloses (see column 5, lines 14-16) forming a solderable surface (40, 52) on at least one of the optical or image sensor subassemblies.

Regarding claims 13, 82 and 83, Kropp discloses (see Figure 4) a method for mounting an optical subassembly to an image sensor subassembly, the method comprising the steps of: forming at least one solderable surface on at least one of the optical and image sensor subassemblies (see column 5, lines 14-16); inherently moving the optical subassembly (44, 45) in proximity with the image sensor subassembly (40)

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to define an interface delimited by at least one solderable surface of the optical subassembly or the image sensor subassembly; and soldering the optical subassembly and the image sensor subassembly together at the interface (see column 5, lines 13-16 and lines 45-53), wherein the subassemblies can be moved freely relative to one another before the soldering step. That is, the instant before the two subassemblies touch and prior to soldering, the subassemblies can be moved freely as claimed.

Regarding claims 26 and 81, Kropp discloses (see Figures 3 and 4) an image sensor subassembly comprising: a substantially rigid member (40); an image sensor chip (42) disposed on the substantially rigid member; and a solderable surface (52) formed on the substantially rigid member (see also column 5, lines 14-16). Kropp further discloses (see Figure 4) the solderable surface consisting of a through-hole (52).

Regarding claims 32 and 80, Kropp discloses (see Figures 3 and 4) an optical subassembly comprising: a substantially rigid member (44); an optical element (45) disposed on the substantially rigid member; and a solderable surface (40) formed on the substantially rigid member (see also column 5, lines 14-16 and lines 45-53). Kropp further discloses (see Figure 4) the solderable surface consisting of a pin (46) having a substantially uniform-diameter body. That is, compared to the width of the subassembly, the pin has a substantially uniform-diameter.

Regarding claims 46, 47 and 86, Kropp discloses (see Figure 4) a method of making an optical and image sensor assembly, the assembly comprising an optical image sensor subassembly and an image sensor subassembly, the method comprising: aligning the optical subassembly and the image sensor subassembly relative to one

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another without contacting the subassemblies against one another in a manner that prevents free movement of the subassemblies relative to one another; and when the subassemblies are properly aligned, securing the subassemblies together. That is, the instant before the two subassemblies touch and prior to soldering, the subassemblies can be moved freely as claimed. Kropp further discloses (see column 5, lines 14-16) forming a solderable surface (40, 52) on at least one of the optical or image sensor subassemblies. Kropp further discloses soldering the optical subassembly and the image sensor subassembly together at the interface (see column 5, lines 13-16 and lines 45-53).

Regarding claims 4, 7, 12, 15, 18, 23, 24, 27, 28, 31, 33, 35, 37, 49, 52, 53, 55, 57, 87, 88, 98, 101-103, 105 and 106 Kropp discloses (see column 5, lines 47-50) plating (metallizing) a solderable material (metal) onto a non-solderable material (40). Kropp further discloses (see Figure 4) making the solderable surface (40 or 52) in an irregular configuration having an increased surface area per unit three dimensional space relative to that of a smooth surface. Kropp also disclose (see Figure 4) the solderable surface is made in the configuration of a through-hole (52). Further, Kropp discloses (see Figure 4) forming a solderable pin (46) on one of the subassemblies and making a hole (48) for receiving the pin on the remaining of the subassemblies. Further, the optical elements of Kropp are inherently aligned with imaging elements of the image sensor subassembly (see Figure 3). Kropp further discloses (see Figure 3) the at least one solderable surfaces include four solderable surfaces (40a-d, 52a-d) formed about a periphery of the image sensor or the optical element. Lastly, Kropp also

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discloses (see Figure 4) the solderable surface is in the configuration of a pin (40) having a body substantially uniform in diameter. That is, compared to the width of the subassembly, the pin has a substantially uniform-diameter.

9. Claims 73, 74, 76-78, 93 and 94, as understood, are rejected under 35 U.S.C. 102(e) as being anticipated by Christensen (U.S. Patent 5,753,908).

Regarding claim 73, 74, 76-78, 93 and 94, Christensen discloses (see Figures 4 and 5) an optical reading device comprising: an optical and image sensor assembly including an image sensor subassembly including an image sensor (52) mounted on a substantially rigid planar member (50), an optical subassembly (80, 10) including an optical element (22, 20, 18, 16) disposed on a substantially rigid member (frame or housing), at least one solderable surface (see Figures 4 and 5) formed on either of the optical subassembly or the substantially rigid planar member defining at least one solder receiving interface between the substantially rigid planar member and the optical subassembly (see Figure 1), solder material for bonding (see column 5, lines 20-30) the subassemblies disposed at the at least one solder receiving interface, and a housing (see Figure 1), the optical and image sensor assembly being disposed in the housing. Christensen further discloses (see Figure 1) the housing partially defines a feed path and wherein the device is a document reading device for reading indicia from documents transported along the feed path. Christensen also discloses (see Figures 4 and 5) the at least one solderable surface is made in an irregular configuration, a through-hole or a pin with a substantially uniform diameter.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 3, 5, 6, 8-11, 14, 16, 17, 19-22, 25, 29, 30, 34, 36, 45, 48, 50, 51, 54, 56, 58, 84, 85, 97, 99, 100, 104, 107 and 108 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kropp.

Regarding claims 3, 5, 14, 16, 48, 50, 97 and 99, Kropp discloses soldering. Kropp does not disclose overmolding non-solderable material onto solderable material or insert molding solderable material in non-solderable material. However, the manner in which solderable material is disposed onto a non-solderable material is well known and is a matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to overmold or insert mold in the method of Kropp in order to obtain a better solderable surface.

Regarding claims 6, 17, 51 and 100, Kropp discloses (see Figure 4) making a frame (44) for the optical subassembly. Kropp does not disclose the frame comprising essentially solderable material, but the protrusions (40) are solderable material. However, the percentage of solderable material that the frame consists of is a matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to provide a frame of solderable material in order to obtain a better bond.

Regarding claims 8, 9, 19-22, 29, 30, 34, 36, 54, 56, 84, 85, 104 and 108, Kropp discloses (see Figure 4) a pin (40) and through-hole (52) type configuration. Kropp also discloses (see Figure 4) the solderable surface is in the configuration of a pin (40) having a body substantially uniform in diameter. That is, compared to the width of the subassembly, the pin has a substantially uniform-diameter. However, the specific shape of the pin, as a threaded screw is a simple matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to thread the pin in order to provide a tighter and stronger bond. Further, it is a matter of design choice which surface is the pin and which is the hole.

Regarding claims 11 and 107, the pin and hole of Kropp fits snugly. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to make the pin smaller than the hole in order to allow for adjustments and make the device more adjustable.

Regarding claim 25, Kropp does not disclose testing the alignment of the image sensor during soldering. However, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to check the alignment by testing the image sensor on a test target in order to confirm the correct alignment of the parts and increase the accuracy and precision of the device.

Regarding claims 45 and 58, Kropp does not disclose aligning using a video monitor which displays an output indicative of an output of an image sensor. However, it is notoriously well known in the art to use vision systems to aid in the alignment of elements since vision systems allow for magnification of images. It would have been

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obvious to a person of ordinary skill in the art at the time the invention was made to align using a video monitor based on an output of an image sensor in the method of Kropp to provide precise alignment.

12. Claims 60, 65, 67 and 72 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kanaya et al.

Regarding claims 60 and 67, Kanaya et al. disclose a housing encapsulating the assembly. Kanaya et al. do not disclose the device partially defining a feed path. However, the type of device in which the assembly is mounted is a matter of design choice. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to mount the assembly of the apparatus of Kanaya et al. on any device to partially define a feed path as desired in order to provide correct alignment.

Regarding claims 65 and 72, Kanaya et al. disclose a pin as the solderable surface. Kanaya et al. do not disclose the solderable surface as a threaded screw. However, the choice of a threaded screw is a simple. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to thread the pin to form a threaded screw in order to provide a tighter and stronger bond.

13. Claims 75 and 79 are rejected under 35 U.S.C. 103(a) as being unpatentable over Christensen.

Regarding claim 75, Christensen discloses the device as part of an optical scanner. Optical scanners inherently have handles. Christensen does not disclose the scanner as a hand held optical reader. However, It would have been obvious to a person of ordinary skill in the art at the time the invention was made to implement the

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method to hand held devices in order to provide easy alignment for portable devices. Furthermore, the type of device in which the assemblies are part is a matter of design choice since it does not affect the core structure of the invention.

Regarding claim 79, Christensen discloses a pin as the solderable surface. Christensen does not disclose the solderable surface as a threaded screw. However, the choice of a threaded screw is a simple. It would have been obvious to a person of ordinary skill in the art at the time the invention was made to thread the pin to form a threaded screw in order to provide a tighter and stronger bond.

Response to Arguments

14. Applicant's arguments filed January 10, 2002 have been fully considered but they are not persuasive.

First, Applicant's request for the withdrawal of finality is now moot since a CPA has been filed.

Regarding claims 59, 61-64, 66 and 68-71, any light that falls upon a photodetector represents an image, thus Kanaya does disclose an image sensor.

Regarding claims 1, 2, 4, 7, 12, 13, 15, 18, 23, 24, 26-28, 31-33, 35, 37, 46, 47, 49, 52, 53 and 55, at the instant before the two subassemblies touch, the claimed condition of the subassemblies being free to move, is met. Also, since "substantially uniform-diameter" is a relative term, as stated above, the pin is substantially uniform in diameter as compared to the width of the subassemblies. Lastly, Kropp does disclose a through-hole (52). The hole goes through the entire element 52, thus, providing a

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through-hole. Applicant's arguments with respect to a threaded screw are not relevant since Applicant simply claims "a group consisting of a through-hole, a pin or a threaded screw." Thus, the limitation is optional.

Regarding claim 73, 74 and 76-78, as stated above, the image sensor subassembly is the IC (50) in which the image sensor is disposed. The optical subassembly is any other part that is separate from the image sensor subassembly, which is 80 and 10. The image sensor subassembly rigid member is the IC itself, wherein the solder-receiving interface is the protruding leads of the IC. Thus, as claimed, Applicant's invention is indistinguishable from Christensen as set forth above.

Thus, the rejection set forth above is proper.

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh X. Luu whose telephone number is (703) 305-0539. The examiner can normally be reached on Monday-Friday from 6:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Seungsook Ham, can be reached on (703) 308-4090. The fax phone number for the organization where the application or proceeding is assigned is (703) 308-7722.


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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

txl
March 28, 2002


Que T. Le
Primary Examiner